originally produced in the fœtus. Blood plasma was poured out in the neighbourhood of the injury, which was first transformed into cartilage, and then into bone. The essential part of the process was the exudation of healthy blood plasma, capable of being converted into osseous structure; the particular tissue or vessels which furnished it was a matter of secondary importance. The exudation might be furnished in one case from bone, in another from periosteum, or the surrounding tissues, and in a third, from all of them. Dr. B. considered that each of the views which had been contended for was true to a certain extent, but incorrect, in as far as they were exclusive in their nature.—*Lond. and Edin. Monthly Journ. Med. Sci.*, May, 1844.

38. *Necrosis.* Dr. J. A. Lawrie relates in the London and Edinburgh Monthly Journal of Medical Science, (August 1843,) four cases of necrosis from which he deduces the following practical and physiological inferences.

"In the treatment of extensive necrosis, two practical difficulties present themselves;—first, in supporting the constitution, and preventing hectic; and, second, in the very tedious process of production of new bone, and the ultimate cure, by discharge of the dead portion. The latter is known to consist in the deposit of new bone, around the old and dead bone, encasing it, and subjecting it to the very doubtful process of absorption, or of separation and escape through the cloacæ in the new bone, and the ulcers in the soft parts. This process is so tedious as sometimes to occupy a lifetime, or to subject the patient to the very painful and uncertain operation of removing the dead bone, or even amputating the limb. So far as I know, no efficient means of meeting and overcoming these difficulties have yet been proposed. The two cases which I have related, show that in certain cases, and these the most severe, they may be obviated by the early removal of the dead bone, before it is encased or entangled in new bone. In neither of the cases was any incision required; in the first, on account of the extensive exposure of the bone; and, in the second, from its being broken, and its extremity projecting through an opening in the soft parts. We cannot, however, expect to find all our cases so favourably circumstanced. In some, the first steps will consist in exposure of the dead bone, by extensive incisions; and the second, in removing the dead bone by the saw and forceps. I have, at present, a case of necrosis of the tibia, under treatment, in which these steps will require to be put in practice.* The advantages of the operation are too numerous and obvious to require to be detailed.

"The physiological inferences which may be drawn from these cases, to my mind decide the question, as to the source from which bones are repaired, or regenerated after necrosis. The opinions on this subject were long divided between the periosteum and soft parts on the one hand, and the bone on the other. That bone, or at all events, calcareous matter, may be deposited in almost any organ or membrane of the body, is too well ascertained to make it improbable, that the same substance may be formed by the soft parts in the neighbourhood of bone, or by the periosteum, whose peculiar functions are to envelope and invigorate bone. That periosteum can form bone I well know, having seen bone deposited on both its surfaces, and into its substance, in considerable quantity. But it is one thing to admit that the vessels of periosteum may secrete or deposit spiculæ of bone, and another, to subscribe to the doctrine that this membrane is the efficient agent in the production of the mass of ossific matter, necessary for the reunion of broken bones, or the reproduction of an entire bone with the exception of the epiphysis. Both of these processes I have long been convinced are performed by bone, and can only be effected through its agency. It is not my intention to speak of the union of fractures,—that subject not being at present under consideration. I shall therefore limit myself to the second,—reproduction of new bone after necrosis; and in the first place, it is worthy of remark, that those bones which have epiphyses are much more certainly and rapidly regenerated after necrosis, than the flat bones, and those

* Since this paper was written, the case has been operated on, and with complete success.

which have no epiphysis. If a large portion of a cranial bone die and separate, it is frequently never restored; if it be renewed, it is by membrane in the first instance, and ultimately by the very slow transformation of that membrane into a thin plate of bone. I am not aware that the bones of the face, excepting of course the lower jaw, are ever restored. On the other hand, the facility with which the cylindrical bones pour out osseous matter is well known. In the next place, if the epiphyses be removed with the body of the bone, no new bone will be formed. This is most frequently illustrated, in the lower jaw, and phalanges of the fingers. In the remarkable case published by Mr. Perry, (*Med. Chir. Trans.* xxi. p. 90,) of necrosis of the lower jaw, while the epiphyses preserved their vitality, a powerful effort was made to restore the dead part; but after the epiphyses died, the new bone died also,—the whole came away, and no further attempt to renew the bone appeared. Lastly, in the cases above related, and I believe that attentive observation will confirm the remark in all similar instances, the new bone was formed by the epiphyses. Where the old bone is extensively exposed, osseous matter is poured out by both epiphyses behind the dead bone, or behind that plane of the bone which is least exposed, and farthest from the surface; the new bone appears in the form of shoots or processes, which advance from both epiphyses, until they meet and coalesce. The deposition is continued from behind forward, until the integrity of the new bone is restored, and the old bone enveloped in it. It is in this way, and not by the deposit of bone on the surface of the periosteum, that the old bone is encased in new.

"A question, at once of physiological and practical importance, here suggests itself. What part does the dead bone play in this process? Does it act as a stimulant to the deposit of ossific matter? Does it serve as a mould for the new bone? If it were removed, would the process be arrested? In all of these questions I would reply in the negative. I do not think that the presence of dead bone is more required to assist in any of the processes involved in the above queries, than the presence of a slough of the softer parts in the generation of new flexible tissues. When the entire thickness of a cylindrical bone dies, the first step towards regeneration consists in an attempt to get rid of the dead part, by the absorbents forming a groove round the dead portion, gradually cutting it through, and isolating it from the living. The next step, to a certain extent cotemporaneous with the first, is the deposit of new osseous matter all around this groove, springing from the bone; the last is the surrounding of the old bone with new, in the manner already explained. The new bone begins to form before the old has separated, and continues after the connection between the two has been quite dissolved. Currie's case appears to me to entitle us to answer the second and third queries in the negative; the old bone was removed long before the new was deposited; the process so far from being thereby arrested, was greatly accelerated, and the form of the new bone was much more symmetrical than if it had been slowly deposited around the old as a mould. It may be asked, if this view of the matter be correct, why is it not thrown off as is a slough of cellular tissue? I believe that the impediments to its escape are mechanical, and not physiological; the soft parts which cover it, the irregular line in which it dies, and the vitality of the cancellous structure next to the epiphysis, extending for some distance within the dead outer case, render its escape impossible, long after its presence has become a source of retarding, it may be, of fatal irritation.

"How soon may the dead bone be removed by operation? The answer appears to be:—As soon as the inflammatory stage has passed, suppuration been fairly established, and the constitutional symptoms will permit. The nature of the operation to be performed must depend on the extent of the disease. When the entire thickness is involved, the necrosed part should be exposed, and a portion cut out, as in Currie's case, and occasional attempts made to extract the portions connected with the epiphyses. There is little risk in hurrying them away too soon, provided violence is not used in the attempts; they will become loose when the natural process of separation is complete, and then compara-

tively little force will be required for their extraction. When the surface of a bone only is exposed and necrosed, it seldom happens that the dead part is encased in a new bone. It generally scales off, and finds its way through the ulcer in the soft part, or through an abscess. Should the dead portion be extensive, and the position of the bone admit of it, it would save time to lay open the sinuses, expose the bone, and remove with a sharp chisel all the dead portion.

39. *Expediency of operating in Cancerous Affections.*—In our preceding Number, (p. 454), we gave a brief notice of a memoir on this subject, read to the Royal Academy of Sciences by M. Leroy d'Etioles, and we now add some further details.

The most important point in this surgical question is to determine if the disease is, in the first instance, purely local, and finally degenerates into a constitutional malady, and if an early operation prevents this degeneration. This belief, though generally acted on, is far from being borne out by statistics. Thus, M. Leroy states that in 801 operations, 117 were performed within less than a year after the first appearance of the disease, and that of these 117 cases 61 had relapsed when the documents relating to them were supplied to him.

The results of operations for cancer of the lip are curious because of the difference that exists between the two sexes. Thus, in 633 males, there were 165 cases of cancer of the lip, 114 of which were operated on by excision, and 12 by caustic; the relapses were 15, that is to say, about one-eighth. Among 2148 females affected with cancer, 34 had cancer of the lip, 22 were operated on, and 7 relapsed, that is to say, a third.

This difference in the relapses depends on the difference in the cause and nature of the malady. In the male, cancroid tumours produced by an external cause tend to diminish; in the female they degenerate into true cancer. In the cancer of the tongue, there is not the same difference in the result—the termination is equally fatal in both sexes. In 9 operations on cancer of the tongue, 3 were performed in less than a year from the commencement of the disease; the 6 other patients died from relapse of the disease.

The following are the results of operations on tumours of the breast:—

Of 277 operations, 73 have been performed within the last two years, and the result is not yet known; 204 cases remain, and in 24 deaths occurred, in one case soon after the operation, and 87 others have already relapsed, so that more than one-half of the operations have failed; 27 were operated on in less than one year from the first symptoms of the affection.

M. Leroy finally maintained the following conclusions:—

1. Extirpation does not arrest the progress of cancer.

2. Extirpation should not be adopted as a general method, except in cancer of the lip and of the skin.

3. Cancer of other organs should not be extirpated, except when hemorrhage from ulcerated cancer threatens speedy death. M. Leroy's memoir was founded on the results of the practice of 70 surgeons, who communicated to him the particulars of all the cases of cancer they had operated on.—*Dublin Med. Press*, May 1844.

40. *Description of a peculiar form of Ulceration to which Cicatrices are liable.*—Mr. Robert Smith communicated to the Surgical Society of Ireland, (April 13th, 1844,) a description of a peculiar form of ulceration to which cicatrices are liable, and which he terms the "fibrous ulcer." Mr. Smith does not consider it as a malignant disease, though he says that in a majority of cases, it is only curable by free excision.

"This peculiar ulcer generally makes its appearance only in a cicatrix; nor does the nature of the lesion of the skin, of which the cicatrix is the result, seem to exercise much influence upon the occurrence of the subsequent morbid change, for it is established with equal frequency in the cicatrices of lacerated wounds, scalds, or burns. I have never seen it attack the cicatrix of a simple incised wound. It does not appear until the cicatrices have existed for several